

Patent Application No.: 10/172,148

Listing of Claims

1. (currently amended) A component tape feeder for supplying pocket tape having components contained therein and a cover tape affixed to a top surface of the pocket tape for retaining the components therein, the component tape feeder comprising consisting of

a tape guide having a peel edge to facilitate the removal of the cover tape from the top surface of the pocket tape before the components reach a pick-up location;

a component tape drive for engaging the pocket tape and advancing said components through said tape guide;

a single folding pulley for encouraging at least one longitudinal fold to be formed within the cover tape once removed at the peel edge;

a cover tape drive;

a control unit, associated with the component tape drive;

a motor for powering at least one of said component tape drive and cover tape drive; and

a cover tape reservoir for receiving folded cover tape therein.

2. (previously presented) The component tape feeder of claim 1, wherein the single folding pulley comprises two inwardly inclined flanges, each of said inwardly inclined flanges including an undercut between each of said inclined flanges and a pulley hub.

3. (currently amended) The component tape feeder of claim 1, further including a wherein the control unit associated with the component tape drive, said control unit receiving receives a signal from said component tape drive indicating the amount of cover tape advanced, wherein the control unit calculates, as a function of the amount of cover tape advanced through said tape guide, the remaining cover tape capacity of the reservoir, wherein the control unit further provides a reservoir fullness gauge by calculating the state of fill of the cover tape reservoir as a function of the amount of cover tape advanced.

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4. (canceled)

5. (canceled)

6. (currently amended) The component tape feeder of claim 1, further including a wherein said control unit and further includes means for measuring a force required to deposit the cover tape into the cover tape reservoir and providing a signal thereof to the control unit, wherein the cover tape reservoir fullness is estimated by the control unit as a function of the force required to deposit cover tape into the cover tape reservoir wherein the means for measuring a force measures the current drawn by a motor operatively engaged to the cover tape drive, where the current is employed to estimate the remaining capacity of the cover tape reservoir.

7. (canceled)

8. (original) The component tape feeder of claim 1, wherein said cover tape reservoir has at least one interior surface that is treated so as to reduce the frictional force between the interior surface and the cover tape.

9. (original) The component tape feeder of claim 1 wherein the interior surface finish of said cover tape reservoir includes a series of random grooves.

10. (canceled)

11. (original) The component tape feeder of claim 1 wherein the perimeter of the cover tape reservoir is defined by a curvilinear path.

12. (currently amended) The component tape feeder of claim 1, wherein the cover tape drive includes gears have with a tooth profile that engages and corrugates the cover tape into segments.

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13. (currently amended) The component feeder of claim 1, wherein the folding pulley is rotatably installed on a frame, and includes at least one channel with a predetermined shape and includes an associated splice deflector, said component feeder cover tape drive further comprising;

a pair of cover tape gears with the cover tape in a nip formed therebetween; and

a drive means for transferring a rotational force to the cover tape gears; wherein the cover tape gears impart a tensile force to draw the cover tape into a single folding pulley and thereby fold the edges concurrently therewithin.

14. (previously presented) The component feeder as claimed in claim 13, wherein said channel has at least two inwardly inclined flanges extending from the outer circumference of the pulley and narrowing toward a hub of said single folding pulley.

15. (previously presented) The component feeder as claimed in claim 14, wherein the root of the channel formed by the two inclined flanges within the folding pulley are undercut between the hub and the inclined flanges.

16. (previously presented) The component feeder as claimed in claim 14, wherein the splice deflector is located between the inwardly inclined flanges and contacts the cover tape whenever a cover tape splice passes over folding pulley.

17. (previously presented) A method for handling cover tape detached from pocket tape, comprising:

folding the longitudinal edges of the cover tape inward to enclose within folded confines of the tape any residual adhesive, wherein folding the longitudinal edges inward increases the stiffness of the cover tape;

corrugating the folded tape as it is pushed into a cover tape reservoir; and monitoring the quantity of cover tape contained in the cover tape reservoir.

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18. (canceled)

19. (original) The method as claimed in claim 17 wherein the step of folding the cover tape comprises pulling the cover tape into a folding pulley including a channel having inclined flanges and at least one undercut between one of said inclined flanges and a hub.

20. (previously presented) The method as claimed in claim 17 wherein corrugating the folded cover tape comprises passing the cover tape through a nip formed between a first cover tape gear and a second cover tape gear, each of said cover tape gears having a plurality of teeth in engagement.

21. (previously presented) A component tape feeder comprising:

 a motor for driving a cover tape removed from the component tape;
 a cover tape reservoir for receiving a driven cover tape therein; and
 a controller for measuring a current required for said cover tape driving motor to overcome a back force imparted by driving the cover tape into the cover tape reservoir, said controller generating a signal to indicate the cover tape reservoir remaining capacity as a function of the driving motor current;

22. (previously presented) The component tape feeder of claim 21, wherein the driving motor current is representative of a drive torque force and said force is employed as an indication of the remaining capacity of the cover tape reservoir.

23. (previously presented) A method for determining a remaining capacity in a cover tape reservoir comprising:

 energizing a cover tape drive motor to cause a cover tape to be driven through a cover tape drive nip and pushed into a cover tape reservoir;
 determining the cover tape reservoir back force at the drive nip; and
 calculating remaining reservoir capacity as a function of the back force.
 monitoring the cover tape reservoir back force at the drive nip;

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calculating remaining reservoir capacity as a function of the back force; comparing the measured back force to at least one threshold; and actuating a signal upon exceeding said threshold.

24. (previously presented) The method of claim 23 wherein the back force is compared to at least one threshold value, and a signal is generated upon exceeding said threshold value.

25. (previously presented) The method of claim 23, wherein determining the cover tape back force and calculating the remaining reservoir capacity further comprises:

measuring a current required by the cover tape drive motor to move the cover tape through the drive nip and into the cover tape reservoir;

comparing the measured current to one of a plurality of predetermined current values, each of the predetermined values associated with a cover tape reservoir capacity; and

indicating the remaining cover tape reservoir capacity in response to the measured current and the comparison to the predetermined values.